

REMARKS

In view of the above amendments and following remarks, reconsideration and further examination are requested.

In reply to the drawing objection as expressed in section 3 of the Office Action, provided herewith is a replacement formal drawing for Fig. 5 which corrects the spelling of --Achieved--.

The specification and abstract have been reviewed and revised to make editorial changes thereto and generally improve the form thereof, and a substitute specification and abstract are provided. Please note that the substitute specification addresses the objections noted by the Examiner in sections 4 and 5 of the Office Action. No new matter has been added by the substitute specification and abstract.

By the current Amendment, claims 1-29 have been canceled and claims 30-39 have been added. New claims 30-39 have been drafted taking into account the 35 U.S.C. § 112, second paragraph, rejection of claim 4, are believed to be free of the basis for this rejection, and are otherwise believed to be in compliance with 35 U.S.C. § 112, second paragraph.

The instant invention pertains to a method of mounting a component onto a substrate, and an apparatus for performing such method. Such a method and apparatus are generally known in the art, but suffer from drawbacks as expressed on pages 1-5 of the original specification. Applicants have addressed and resolved these drawbacks by providing a unique method and apparatus.

Specifically, the inventive method comprises: using nozzles, connected to a single vacuum generating device, to pick up components and mount the components onto respective predetermined mounting positions of a circuit substrate; preventing occurrence of a defective circuit substrate, due to a component failing to be mounted on the circuit substrate, by (i) detecting vacuum pressure decrease of one of the nozzles relative to a vacuum pressure to be achieved at a time of picking up a component by this nozzles, (ii) making a judgment that this nozzle has lost the component due to dropping of the component, if the vacuum pressure

decrease of this nozzle exceeds a predetermined first threshold, and (iii) skipping a component mounting operation to be performed by this nozzle.

New claim 30 is believed to be representative of the inventive method, and new claim 39 is believed to be representative of the inventive apparatus.

In the Office Action: claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Cameron et al. in view of Jordan et al.; claims 2 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cameron et al. in view of Jordan et al., and further in view of Scholten et al.; claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Cameron et al. in view of Jordan et al., and Scholten et al., and further in view of Yamamoto et al.; and claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Scholten et al. in view of Cameron et al. These rejections are respectfully traversed and the relied-upon references are not applicable with regard to the newly added claims for the following reasons.

Claim 30 recites

A method comprising:
using nozzles, connected to a single vacuum generating device, to perform component pick up operations by picking up components and perform component mounting operations by mounting said components onto respective predetermined mounting positions of a circuit substrate; and
preventing occurrence of a defective circuit substrate, due to a component failing to be mounted on said circuit substrate, by
(i) *detecting vacuum pressure decrease of one of said nozzles relative to a vacuum pressure to be achieved at a time of picking up a component by said one of said nozzles;*
(ii) *making a judgment that said one of said nozzles has lost the component due to dropping of the component, if said vacuum pressure decrease of said one of said nozzles exceeds a predetermined first threshold,* and
(iii) skipping a component mounting operation to be performed by said one of said nozzles.

The primary references relied upon in rejecting the claims are Cameron et al. and Scholten et al.

Initially, contrary to the position taken by the Examiner, Cameron et al. does not disclose using nozzles to pick up and mount components onto a circuit substrate. Rather, Cameron et al. discloses using a vacuum to pick up and handle substrates, but is silent with regard to using a vacuum to pick up and mount components onto these substrates. Though Scholten et al. discloses using nozzles to pick up and handle electronic components, and determining when a nozzle is not holding a component, the manner by which this determination is made is different from that as claimed. In this regard, in the absence of a component on a nozzle of Scholten et al., air flow produced by the vacuum is converted into an acoustic signal.

To the contrary, claim 30 requires operations of

detecting vacuum pressure decrease of one of said nozzles *relative to a vacuum pressure to be achieved at a time of picking up a component* by said one of said nozzles...making a judgment that said one of said nozzles has lost the component due to dropping of the component, if *said vacuum pressure decrease of said one of said nozzles exceeds a predetermined first threshold*.

Scholten et al. does not detect a vacuum pressure decrease **relative to a vacuum pressure to be achieved at a time of picking up a component**, nor does Scholten et al. determine that a component is missing if **the vacuum pressure decrease of the nozzle exceeds a predetermined first threshold**. Analogous features are lacking from Cameron et al., whereby claims 30-39 are allowable over a combination of these references.

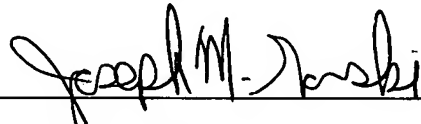
The remaining references do not resolve the above deficiencies of Cameron et al. and Scholten et al., whereby claims 30-39 are allowable over the relied-upon references either taken alone or in combination.

In view of the above amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

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